DOCUMENT RESUME

ED 325 037 HE 023 954

AUTHOR	Corrigan, Dean C.; Mobley, William H.
TITLE	Educational Reform Agenda and Partnerships.
PUB DATE	Sep 90
NOTE	31p.; Paper presented at the Conference on School-University Partnerships (Washington, DC, September 17-18, 1990).
PUB TYPE	Speeches/Conference Papers (150)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Agency Cooperation; *Cooperative Programs; *Educational Change; *Educational Cooperation; *Educational Planning; Educational Policy; Higher Education; *Institutional Cooperation; Land Grant Universities; *Models
IDENTIFIERS	Texas A and M University

ABSTRACT

Major factors contributing to the crisis in United States education are summarized, including poverty, changes in the American family, child abuse, changes in the ethnic composition of schools, increasing global competition, decline in traditional student performance measures, crisis in mathematics and science, shortages of teachers, shift in the make-up of the work force, the dropout situation, and intergenerational interdependence. The educational reform movement is discussed, both historically and with its current emphases on teacher empowerment, restructuring schools as centers of inquiry, allowing a "bottom-up" strategy for change, and establishing accountability for results. Texas A & M University's response to the crisis is then described. It involves the creation of Commitment to Education (CTE), a task force for initiating new solutions to education and education-related issues. CTE fosters collaboration among schools, business/industry, and universities to achieve more effective use of resources and talents. Lessons learned from such collaborative ventures include an understanding of the complexity of collaboration and the importance of clearly defined values. The land-grant university system is recommended as a model to bring about the educational reforms needed, by fostering and implementing educational research and development as accomplished in the fields of agriculture and engineering. Includes 41 references. (JDD)

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EDUCATIONAL REFORM AGENDA AND PARTNERSHIPS§

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by Dean C. Corrigan
and
William H. Mobley
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Texas A&M University
College Station, Texas

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THE CHALLENGE

The purpose of this resource paper is to help to set the stage for the discussion of collaboration in the broader context of educational reform.

As we move into the 1990's, our nation at risk is rapidly becoming a nation in crisis. The United States, once unchallenged in education, science and technology, is being overtaken by well-educated and highly motivated competitors around the world.

The world has indeed become a global village; such an interconnected, interdependent world economy demands an increasingly technologically-literate, skilled and educated work force able to perform the tasks of a new information economy. If we are to maintain our position as a first-rate political and economic power, education must provide -- more than ever before -- the infrastructure to under-gird our prosperity, security and civility.

The challenge for education is not only to solve the drop-out problem. It is to prepare a greater proportion of our citizens for the new technologies required by a changing work force in which higher order thinking skills will be essential. Therefore, we must not only keep young people in school, we must teach them the

HE 023 954

§ Presented at the conference on School-University Partnerships sponsored by the Fund for the Improvement of Post-Secondary Education (FIPSE) and the Fund for the Improvement and Reform of Schools and Teaching (FIRST), The Grand Hotel, Washington D. C., September 17-18, 1990.

"new" basics. This perspective was stated emphatically by the National Science Board Commission on Pre-Collegiate Education (1983):

> We must return to basics, but the "basics" of the 21st century are not only reading, writing, and arithmetic. They include communication and higher problem-solving skills, and scientific and technological literacy -- the thinking tools that allow us to understand the technological world around us. These new basics are needed by *all* students -- not only the talented and fortunate -- not only the few for whom excellence is a social and economic tradition.

The schools must go beyond the goal of just understanding the tech[illegible] aspects of the technological world around us and economic development. Education is for making a life as well as making a living. Students must experience examples of compassion, inquiry, moral vision, cultured outlook, optimism, and other characteristics influenced and developed through education. The quality of life in a society transcends material success, vital as that is to live fully. What is done with material success is as important as material success itself.

Too often we have acted as if education is a valueless activity with no relationship to the great problems of our time. Too often we have maintained the "illusion of neutrality." America's schools must become an instrument to teach this generation of Americans to shape the future, not just inherit it. In today's "global village," there is no such thing as value-free education. There is only choice to be conscious and positive about our values or to conceal and confuse them.

There has never been a time when fundamental American values are so much in demand. All one has to do is read the daily newspaper or tune in the news on TV to realize that America needs a new supply of honesty, integrity, optimism, and good, old-fashioned concern for and commitment to do something about the plight of others less fortunate than ourselves -- the poor and the educationally disadvantaged.

The crisis facing Texas and the nation is real and immediate; the issues are complex and inextricably linked to the entire scope of our educational system from pre-K-12 through undergraduate post-secondary education to the Ph.D. and

professional degrees. Some of the major factors contributing to the crisis are summarized here.

THE CONTEXT: EDUCATION AND SOCIETY

Children in Poverty

We are still confronted with the number one problem in building a better nation: improving the quality of education for *all* of the children of *all* of our people. America's schools are presently set up to produce winners and losers. Many children are doomed to fail before they start. None of us, as adults, would continue to play a game we had no chance of winning, yet we expect some children to do this every day in school. Because of the relationship between poverty and access to equal educational opportunity, it is usually the children from poor families who find themselves at the bottom of the heap. The number of youth in this category is increasing at an alarming rate.

According to the House Ways and Means Committee, average family income for the lowest fifth of families with children has declined by 13.8 percent in the period 1979-1987 (Passell 1990). A recent report on the status of children in need (Ford Foundation Project on the American Future 1989) indicates that one in five children lives in poverty. More than 12 million American children, the equivalent of half the population of Canada, are now poor. Depending upon the definition of poverty you choose, that figure can escalate.

Some of this is the result of the changing nature of the family in American society. Over half of all new marriages are likely to end in divorce. The average income for married couples with children is $32,206; for female households with children that figure drops to $11,299 (Hodgkinson 1989).

Changing Nature of the American Family

Today almost 16 million children live with only one parent, usually the mother. For some 3.3 million of these children, their mother is yet a child herself; the proportion of out-of-wedlock births to teenagers has soared. Every day in our country 40 teenagers give birth to their third child. The public views this as a minority problem; motherhood among European Americans teenagers in the United States is double the rate of any other developed nation (W.T. Grant

Foundation Commission 1988). To exacerbate this situation, the children of children tend to have lower birthweight and other kinds of health problems. Buccino (1988) finds this phenomenon alone a significant factor underlying the prediction that there will be an increased proportion of children in our elementary and secondary schools with special learning needs and thus more difficult to teach.

The American family is changing in other ways as well. More short-cycle families, those that produce a new generation approximately every 14 years, exist than at any other time in our history (Hodgkinson 1989). Many of these short-cycle families are part of the ghetto poor, considered by many to be "truly disadvantaged," mired in isolation in a cycle of hopelessness and joblessness through economic dislocation (Wilson 1987). A second modern phenomenon changing the structure of American society is the multiple-dependent family. Longer life expectancy has left many middle-aged Americans with elderly parents to take care of while at the same time coping with raising their own children, or in some cases, the children of their children. It is not uncommon to find individuals with primary care responsibilities for four generations of their family. Young families will now spend as many years taking care of dependent parents as they will taking care of dependent children (Hodgkinson 1989).

Child Abuse In and Out of School

With such societal change and associated tensions taking place it is little wonder to see that the rates of child abuse and neglect are growing. More than two million cases are reported each year. Child abuse continues in the schools in the form of corporal punishment, the legal beating of children, which is still permitted in thirty-two states. The legal definition of corporal punishment is the "administration of physical pain as punishment." Studies show that a disproportionate number of poor children are so abused. Studies also show that the same children are paddled over and over again, just one indication of the ineffectiveness of this intervention. Healthy human beings cannot emerge from unhealthy organizations. Children learn what they live. If a child is abused--beaten --at home and lives in a condition of abysmal poverty, how will he or she learn to develop a sense of optimism about the future, if not in school? The school must reverse the spiral toward futility for many of our children. If ever we needed a kinder, gentler America, it is now.

Changing Demographics

Demographic changes in the United States are challenging our society in its efforts to improve education. The Hispanic population in our nation is growing at a rate of 3.7 percent a year; the African American population at a rate of 1.5 percent; European Americans at .8 percent (U.S. Bureau of the Census 1990). In Texas the ethnic composition of the schools is changing rapidly. Hispanic and African American children currently make up half of the 2nd Grade and proportions increase with decreasing age groups. Nationally, by the year 2000 one out of every three students in America's schools will be from groups we traditionally think of as minorities (Commission on Minority Participation 1988).

In thirty years it is estimated that 70 percent of the U.S. work force will be people of color and women. This invites comment and scrutiny not for any pejorative reason but because of the disproportionately low numbers of such "minorities" in many essential fields. Last year in Texas one African American engineer and one Hispanic engineer graduated with doctoral degrees. Of 365 doctorates awarded in the physical sciences in this state, two were obtained by African Americans and six by Hispanics. Only 4.2 percent of the tenured faculty in Texas are African American; 2.7 percent are Hispanic. If the historically African American universities of Prairie View A&M and Texas Southern University are not included, the percentage of African American faculty falls to 1.1 percent (Ashworth 1990).

We are living in a culturally pluralistic society. It appears obvious that the preparation of any teacher in any subject at any level must include the knowledge, skills, and values necessary to competently reach and teach students of increasingly diverse ethnic backgrounds. We have a long way to go to develop teacher education programs that meet this kind of multicultural education standard.

Increasing Global Competition

All of this is occurring in a period of enormous economic upheaval. We are living in an age characterized by "global mercantilism." The United States is no longer the single world economic leader, but must now compete with other major industrial nations. We exist in an increasingly interconnected and interdependent global economy, one fraught with competition and problems. The United States

once had fifty percent of the world market; we now have twelve percent. Only five years ago, thirty percent of the companies in our nation faced foreign firms in the marketplace; today seventy-five percent are confronted by international competition (Nabers 1990). The United States faces increasing competition from all industrialized nations including some considered underdeveloped twenty years ago.

Four of every five new jobs in this country are generated as a direct result of foreign trade. Yet many of our jobs have moved "offshore" in search of less-expensive labor (Council on International Educational Exchange 1988). Texas Instruments uses Indian electrical engineers at one-third the cost of American-trained engineers, to do preliminary design work for new integrated circuits on CAD systems in Bangalore, India. Their work is then beamed via satellite to TI headquarters to be finalized (Weidemann 1990). We do not seem prepared or able to maintain our world economic position in this era of global mercantilism. Nearly forty percent of businesses surveyed admitted that they had not fully exploited international business opportunities because of insufficient international competence (Coalition for the Advancement of Foreign Languages and International Studies 1989). Reports and surveys have shown that Americans are geographically illiterate and ignorant of global issues and the language and culture of other nations. Educational, business, and civic leaders in Texas and throughout the nation are alarmed and recognize the need to educate our citizens to respond to these conditions which endanger our national security.

Decline in Traditional Student Performance Measures

American student performance continues to decline by all standard measurements. Average verbal skills of college-bound high school seniors have declined to their lowest level in a decade although indicators such as SAT scores have shown some gains among minorities. This year American Indian, Asian American, African American and Puerto Rican women showed an improvement in math scores over previous years (Celis 1990). Other assessments place American youth below average when compared to the youth of our primary economic competitors. In a 1988 study of the science ability of children in 17 nations, 10 year-olds from the United States ranked 8th and 14 year-olds ranked 14th. The National Geographic Society had the Gallup Organization assess simple place knowledge in twelve nations. Americans, aged 18 to 24, scored worst, below that of even the less-developed nation of Mexico (National Geographic Society 1990). Our pre-college

education system has reached a crisis state in which our students are no longer competitive with those in other nations.

Crisis in Mathematics, Science and Engineering

This situation is especially acute in the disciplines of mathematics, science, and engineering. NAEP found that an alarmingly low 7 percent of 17-year-olds had the knowledge and skills needed to do well in college-level science courses and that their achievement in science had declined as compared to 1969 levels (McCormick 1989). The National Science Foundation predicts that the United States will have a shortage of 675,000 scientists and engineers by the year 2006. By the 10th grade 80 percent of the students have been lost to the mathematics, science, and engineering talent pool. The scientific pipeline is drying up; American science education is in trouble. The science deficit threatens our prosperity and national security.

The supply and demand for science and engineering Ph.D.'s is a national crisis in the making. In the next ten years there will be a projected shortfall of more than 7,500 Ph.D.'s in industry and academia. The projected faculty deficit has been called a "seed corn" problem. We are not producing enough of the scientists and engineers needed to conduct basic research and train future generations of scholars and scientists. Another alarming change has been the rapid increase in the percentage of Ph.D.'s awarded to foreign citizens in all fields of science and engineering and a steady decline in U.S. citizens seeking advanced degrees. More than 50 percent of the Ph.D. candidates in U.S. institutions in these disciplines are from abroad (Madison 1990).

Shortages of Teachers

Our nation suffers from a shortage of pre-collegiate academically-talented teachers, minority teachers, and math and science teachers (Chira 1990). More than ever such teachers are needed to prepare youth from an increasingly multicultural context for an economy that demands sophisticated technical knowledge and is thus less tolerant of dropouts. While the number of minority children in the schools is increasing, the number of minority teachers is declining rapidly (AACTE 1988). Last year 81 percent of teacher education students were female and 92 percent were European American. Only 4.7 percent were African American; 1.6 percent Hispanic and 1.5 percent Asian American. Acute shortages of qualified mathematics and

science teachers have led to substantial numbers of unqualified teachers taking primary responsibility for "supplying the pipeline" in these crucial areas.

Shift in Make-up of Work Force

Within our own nation we are experiencing an economic shift. More and more Americans are employed in the service sector and in that sector of the economy involved in producing information, the so-called quaternary sector. This shift has created more highly-skilled jobs at the cost of well-paying, low-skilled jobs. By 1995 only 5.7 percent of the nation's jobs will be unskilled; by the turn of the century, nearly a third will require a college education. Simultaneously, illiteracy in the workplace is a growing problem. More than 23 million American adults are functionally illiterate; more than 13 percent of all 17 year-olds and 40 percent of minority youths (Committee for Economic Development 1985). In Texas alone the cost of having one in three Texans functionally illiterate is estimated at $17 billion in lost income, lost tax revenue, unemployment insurance, adult education, and the increased cost of welfare and prison incarceration. The jobs of the future will demand a greater degree of fluency and skill. While demand for scientific and technical personnel is expected to increase 36 percent by the turn of the century, the pool of potential workers able to adequately perform even relatively low-level tasks is shrinking. Our economic viability is threatened by an unprepared work force.

The Dropout Situation

The situation is even bleaker when the student dropout rate is considered. Close to a million students, or 25 percent, leave U.S. secondary schools annually before graduation. Some 3,800 young people drop out of high school every day. Each class of dropouts will eventually cost the nation $240 billion in lost earnings and taxes. Texas ranks 42nd in the nation with a dropout rate of over 30 percent. Nationally the dropout rate in urban areas for African American students has reached over fifty percent; the National Center for Education Information estimates the Hispanic dropout rate is at least 40 percent (Krogh 1987). Far too many of our youth are at-risk.

The student dropout situation takes on a new sense of urgency when viewed beside the data on the changing dependency ratio between youth and the elderly. The most rapidly growing age group in America is people over 85 (Hodgkinson

1986). A little over two million people (2.2) are over 85; 34,000 citizens are 100 years of age or older. Twenty-four million people are over 65. In 1983 we crossed a major watershed in the United States. We had, for the first time, more people over age 65 than we had teenagers. The two trends of a shrinking work-age cohort accompanied by a growing aged and dependent population will place strain on an already over-burdened economy (Hodgkinson 1989). Just as many lesser developed countries find it is difficult to develop modern economies because of dependency problems, so this nation may find its growth curve impeded by a stultifying ratio of productive youth to dependent elderly. In 1950 there were 17 workers to pay the benefits of each retiree. In 1995, only three workers will provide the funds for each retiree and one of the three will be a member of a minority group (Johnston and Packer 1987, Cetron, Rocha and Luckins 1988).

Intergenerational Interdependence

The future of the aging white middle class will be determined in part by the successes of young minorities in getting a sound education and a good job. If 50 percent of the students flunk out of school before the 10th grade and stay on welfare until they are 65, no one will be able to retire. For the first time, due to demographic changes, we are interdependent; our futures are all inextricably interlocked. Hopefully those Americans who have been unwilling to respond positively to the argument for social and economic rights for all on humane grounds will now be convinced to respond positively because it is in their own self-interest to do so.

We are a society with a shortage of youth and a rapidly increasing senior citizen population. Levin (1985), a Stanford University economist, frames the challenge when he says, "We've got to educate all of our children because we simply cannot afford to waste them, economically or otherwise." Completely aside from the humanitarian concern about wasted lives, our society must now ensure, for economic reasons, that everybody counts and that everybody is productive in the nation's economy. The reason David T. Kearns, former CEO of Xerox, has written a book titled *Winning the Brain Race: A Bold Plan to Make Our Schools Competitive* (1988) and taken out six-page advertisements in major magazines to share his recommendations on educational reform is not just altruism. He is worried that United States industry will soon be importing workers unless we can increase the number of graduates from America's schools.

Using schools to select winners is a bad idea even when there is an abundance of youth; it is a foolhardy role for the schools when the country is short of youth and needs to get the highest performance out of every student. Rather than picking winners the school must now creatively engage students of all backgrounds and all ability levels (Hodgkinson 1986). The major purpose for tomorrow's schools is to help an increasingly diverse school population to cultivate a sense of optimism about themselves and their future. We must reach and teach all of America's children to become all they are capable of becoming (Corrigan 1988). All this adds up to a challenge of staggering proportions.

STATUS OF THE EDUCATIONAL REFORM MOVEMENT

The schools have been inundated with proposals for reform; at last count thirty-five national reports and over 200 state blue ribbon committee reports have appeared. Seven years ago, the National Commission on Excellence in Education (1983) released its momentous report provocatively entitled *A Nation At Risk: The Imperative for Educational Reform* (1983). Its rhetoric was not easy to ignore:

> We report to the American people that while we can take justifiable pride in what our schools and colleges have historically accomplished and contributed to the United States and the well-being of its people, the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people. What was unimaginable a generation ago has begun to occur -- others are matching and surpassing our educational attainments.
>
> If an unfriendly power had attempted to impose on America the mediocre educational performance that exists today, we might have viewed it as an act of war.... We have, in effect, been committing an act of unthinking, unilateral educational disarmament.

This publication stimulated a reaction which has become known as the *educational reform movement*. Rarely, if ever, in our history has such a report been so shockingly forthright, aroused comparable concern, or triggered such a response -- a response which took on the characteristics of a national confessional and revival. The "rising tide of mediocrity" was met by a veritable flood of studies

and reports emanating from government agencies, public interest groups, and professional organizations.

The first wave of reform was characterized by crisis resolution efforts to raise the achievement level of students. Reform through regulation was the major visible strategy. Tougher and longer doses of the "old school" formula was the aim. Lack of attention to the problems of school forceouts and dropouts, especially among disadvantaged students, and a decline in teacher morale revealed the limitations of the first wave efforts. Teacher education was little affected by this wave. The schools were its object. It soon became apparent that first wave proposals were inadequate, and outmoded, and in some respects counterproductive. Attention turned in other directions.

A second reform wave shifted attention to teacher performance. Teacher testing was introduced and emphasis placed increasingly on teacher supervision, appraisal, and accountability. This second wave was a trying time for teachers. The reform agenda called for them to account individually and collectively for the effectiveness of their profession, a profession in which they had been treated as executors of somebody else's orders rather than as professional decision-makers.

Hard on the heels of the second wave of reform, the third wave formed. The rapidity of the response was surprising. Also surprising has been the number of active, involved groups, each with an agenda, abundant resources, and vast influence.

Four concepts pervade the educational reform debate today: teacher empowerment; restructuring schools as centers of inquiry; creating the conditions for professional practice, including the autonomy and flexibility to allow a "bottom-up" strategy for change; and establishing accountability for results at the local, state and national level. The trade off for more autonomy, local choices, and professional trust is accountability.

The third wave promises to rouse the education system in a search for conditions favorable to teacher professionalization. Unlike the previous waves, and unlike earlier reform movements, the new teacher professionalization effort will challenge the dominance of an outmoded system of organization and management over the teaching profession. The ultimate goal is to win professional status and

conditions for teaching. The confrontation should not be perceived as a power play nor should it be perceived as directed against the administrative system as such. Its purpose is to gain for the schools the most effective teaching profession possible.

The key word in all of the recent reports on reforming education is *empowerment*, empowering teachers themselves to reform their profession and the settings in which they work. The Carnegie Forum's Task Force (1986) states the message clearly:

> Textbooks cannot do it. Principals cannot do it. Directives from state authorities cannot do it. Only the people with whom the students come in contact every day can do it. Though many people have vital roles to play, only teachers can finally accomplish the agenda we have just laid out.

In the third wave, teacher education has occupied a more prominent place on the action agenda. The early reform waves paid scant attention to teacher education though criticism was far from absent. Earlier, reformers had been concerned with quick solutions to the problems of raising test scores and restoring America's favorable position in terms of international economic competitiveness. At the same time, however, other interests were making the case that attention needed to focus on the conditions which contributed to the current state of schooling as well as on expanding the purposes of education being considered.

Today the powers-that-be have realized that if real reform is to take place efforts must be focused on the quality of the interaction between the student, the teacher and the curriculum. Any reform that does not affect that relationship positively is not helpful. Excellence and creativity by fiat is impossible. Reform through regulation does not work. It too often produces a straight jacket that is counter-productive for students and teachers alike. More and more policy makers recognize that the people who are going to put a plan into action must be involved in helping to develop that plan. This is especially true if they are expected to understand it and feel a sense of ownership and commitment to it over the long haul.

The previous waves of reform emphasized a longer school day and year; tougher standards; state mandated policies and school curricula; and more extensive testing. The current stage of the movement is focusing on strengthening local

autonomy and the discretion of school systems; on individual schools; and on educational professionals and their efforts to bring about the substantive changes earlier reform efforts were designed to identify.

For example, the recent report from the Task Force on Education of the National Governor's Association (NGA 1990) urges states to deregulate the educational system to permit schools to become more innovative. The NGA report proposes that each local school be given the authority to set its own curriculum, decide which instructional arrangements to employ, organize the school day th way it wants to, decide which concepts and content it wants to emphasize (and de-emphasize), determine the texts it wants to use and the tests it wants to employ to assess student performance and hire teachers with varied preparation and experience. This report, like *Investing in Our Children* published by the Committee for Economic Development (1985), supports a "bottom-up" strategy.

Professional trust, autonomy, flexibility at the local level, and school-unit accountability for learner outcomes are envisioned. As school systems develop school-based management, teacher educators from universities will be expected to reinforce the efforts of principals, teachers, and parents. The universities will become more involved in the formation of business/school partnerships and in the search to improve the conditions of children and families beyond the school. A central notion in all future strategies is the idea of collaboration between and among schools, universities, and business and industry. No single institution can take ownership of past failures or future successes. There also seems to be another important realization -- it is a waste of time to sit around and place blame.

We all know the American school today is in crisis. The primary reason, and it cannot be said too often, is because the school's role has changed greatly, not that the school has necessarily become worse. What has changed is that school has assumed such importance for the individual, for the community, for the economy, and for the society, that we cannot put up with an obsolete educational system.

TEXAS A&M'S RESPONSE: A COLLABORATIVE MODEL

Realizing the public service obligations inherent in being a Land-Grant university and recognizing a sense of urgency in dealing with the crisis facing education and society, we decided to be proactive to meet the challenge. In

September, 1989, Texas A&M University focused the attention of its Board of Regents on the education crisis facing Texas and the nation. A report prepared for the Board, *Commitment to Education: The State and National Leadership Role of Texas A&M University* (Mobley and Gage 1989), reviewed the current situation by chronicling the aforementioned economic, demographic, and societal changes buffeting our nation. We summarized the areas of concern dominating education today: the crisis in math, science and technology, the increase in at-risk students, the threat to our economic viability presented by an increasingly unskilled work force, and a shortage of qualified teachers and faculty to deal with these problems. A review of current efforts to deal with these issues indicated that Texas A&M had already taken a leadership role to correct many of the factors which have produced the educational crisis. The briefing concluded with this statement:

> Although Texas A&M University is already addressing many of the problems facing education, there is more that we can and should do to take an even greater leadership role. The University must build on it strengths, focus existing programs, aggressively pursue selected high impact programs and leverage a collaborative effort with the other System components and institutions.

As a result of this report, the Board of Regents authorized the creation of *Commitment to Education* (CTE), a task force for initiating new solutions to education and education-related issues facing Texas and the nation. We realized early on that solving this crisis would require the development of new ways for schools, business and industry, and universities to work together. Collaboration among these groups was needed to achieve a more effective use of resources and talents to foster educational innovation and improvement. *Commitment to Education* is based on that notion. The CTE task force is made up of representatives from public schools, the private sector, and Texas A&M University and its System institutions chosen for their ability to enhance collaboration across the network of participating partners.

Commitment to Education builds its agenda by focusing on novel approaches to old problems. Rather than cataloguing what doesn't work and why nothing seems to happen, CTE supports fresh perspectives. The goal is to appeal to the creative nature in all humans to develop new programs in education. CTE aims to marshal the resources necessary to move untried ideas into action, study the results,

and share the best we find in research and practice. Thus, CTE hopes to stimulate "lighthouses" for innovation in education and to develop a free market of educational ideas. This is the special niche for CTE in the general reformist schema: CTE functions not to develop policy but to provide possible solutions and alternatives for policy makers.

The first CTE task force meeting was held on 24 January 1990. It provided opportunities for the participants to share ideas on major issues facing education today. Other meetings of the 80 member group have followed. During the meetings, CTE has organized sub-groups clustered around six critical subjects: Developing a Global Perspective; Students and Families At-Risk; Minority Development; Adult Literacy; Leadership Development; and Science, Mathematics and Technology. Task force members have met with researchers involved with these topics to discuss further proposal development, implementation, and funding issues. Regional meetings in Dallas, Houston, and Austin have forged links among task force members and other leaders in business and education in the state of Texas. A link has been established with other alliances and coalitions. CTE actually is designed to "network the networks." A few guides for action and focus have emerged from meetings to date.

CTE will work with partners to:

- *Prepare students in the Four R's* -- reasoning as well as reading, 'riting and 'rithmetic;
- *Meet the social and intellectual needs* of at-risk students and families;
- *Emphasize global awareness* by developing a world perspective and encouraging understanding and respect for our pluralistic society;
- *Stress the importance* of math, science, and technology competency;
- *Recruit, educate, and retrain teachers* in critical areas at all levels of education from primary education through graduate studies;

- *Restructure schools* as centers of inquiry for teachers and students;
- *Develop joint ventures* involving schools, the university, and the private sector.
- *Focus* existing programs;
- *Pursue* new initiatives aggressively; and
- *Leverage* collaborative efforts between the public school system and the private sector -- potential new partners in education.

To facilitate the implementation of these guidelines, we have published a prospectus listing pertinent projects taking place throughout the University and System. The *Prospectus* highlights new models for action in the way in which these programs are interwoven throughout the University community and the need for strong linkage with public school education and institutions of higher education with large minority populations.

The *Prospectus* document serves multiple purposes. It provides information needed to identify areas of institutional strength and weakness and gives scholars the opportunity to network collaboratively with peers conducting similar programs on the Texas A&M and System campuses. It also showcases existing model programs that combine input from the three task force constituencies: public schools, higher education, and the private sector.

CTE is creating a library of proposals and related grant and contract announcements to facilitate this process. A calender/newsletter available to task force members and other interested individuals disseminates such information. Finally, CTE is creating a data base master file of university faculty, public school districts, and industry and their associated research and development interests related to the critical areas of educational concerns.

In June 1990 CTE sponsored the *New Directions in Education* conference which was attended by over 300 invited leaders from around the state and nation. The two-day symposium, the first of a yearly series, was organized around three

themes: the private sector in partnership with education; making the system work for *all* American children; and programs that move policies and goals from thought to action. Each topic represented a new direction that needs to be explored if efforts to reform the education system of our nation are to be successful. Two nationally known speakers, who epitomized the debate on the pros and cons of collaboration and partnership, addressed the plenary sessions. Henry A. Giroux spoke on diversity and curriculum and the restructuring of tomorrow's schools, and Denis P. Doyle talked about investing in our children and new concepts of teacher leadership and school choice.

Recently CTE has been given a new charge. Texas A&M University has been designated by Governor Bill Clements as the lead institution to prepare a proposal for the state of Texas for the National Science Foundation (NSF) titled *Statewide Systemic Initiative*. The purpose of the NSF grant is to significantly improve science, mathematics and engineering education from kindergarten through post-secondary education by focusing on specific areas of educational reform and long-term collaborative ventures involving schools, universities, business and industry, state agency linkages, and policy makers.

A series of regional meetings around the state with over 200 teachers, university faculty and administrators, engineers, scientists, state education agency personnel, and with representatives from the Governor's office and the Texas Legislature have been called to draw together the various constituents critical to the success of such an initiative. An initial proposal was developed suggesting the development of regional collaboratives across the state; the creation of a forum for state lawmakers, Texas Education Agency personnel, public school, university, and business leaders; the development of national networking activities; and the collection of evaluation data on these activities. By forging such partnerships we at Texas A&M University are in an excellent position to influence change and encourage continuous school/university/business dialogue.

We think *Commitment to Education* is a unique program. It is unique because it links the University and its System, the public schools, and the business and industry community in an effort to solve common problems. This organization takes a broad perspective on education. We work on the assumption that one must attack problems at their roots.

LESSONS LEARNED FROM COLLABORATION

The experience gained from *Commitment to Education* and other collaborative ventures has produced some lessons to consider. They are mentioned here as points for future discussion.

Collaboration is easier to say than it is to do. Collaboration, the development of partnerships, the development of a joint activity, is a complex process. Actually the school, the university, and business and industry settings could each be considered a different culture. Each has its own rules (policies), roles, expectations, and reward system. When people from different institutions come together to create a new entity their behavior is often based on the rules, roles, expectations, and rewards that exist in their home settings. Actually, the new collaborative venture has to agree on the rules, roles, expectations and rewards that will guide it and to get the home setting to accommodate participation.

As Ladd (1969) stated years ago in his monograph on *Sources of Tension in School-University Collaboration:*

> Any collaborative venture between two or more organizations is presumably a venture in which the people in the one organization and the people in the other propose to work together so that each group can achieve things it wants to achieve which by itself it could achieve either less satisfactorily or not at all. Thus, for each group the venture means new help for the achieving of its objectives. It means that, in a sense, members of one group become the others' agents. For the new help which each group expects to get from the other, over and above any explicit *quid pro quo* it may have to pay, it pays in several important ways. These include accepting increased possibilities of exposure, developing new arrangements and learning new habits, giving up old ways of doing things, and confronting differences which may cause misunderstanding or even resentment.

In addition to the sources of tension which are endemic in any interorganizational collaboration, tensions often emerge from fundamental differences in the goals of the partners involved. Furthermore, there are a wide range of differences found in the customs, characteristics, and styles of operation in

different work settings that must be accommodated. They include differences relating to policy-making; the role of the written word and means of communication; work load and scheduling; attitudes toward cooperation, expenditure of funds and budgeting patterns (merit systems, civil service, salary schedules, etc.); research and development procedures; personnel practices; degrees of personal commitment to the organization and professional bodies; perceived relative status or self-esteem (public image); and educational, political and social views. In so far as these differences are understood, anticipated and planned for by leaders of the new collaborative venture, the frustration they cause will be more or less intense.

The most important issue to decide and make clear at the outset of any new, collaborative venture is the purpose or purposes of the endeavor, the ends to be achieved by collaboration. A clearly defined values-base is an essential foundation for any new partnership. Once purposes and the activities to carry them out are defined, decisions can be made regarding what particular talent each partner can contribute. Purposes for collaboration from the business and/or the university perspective may not be the same as the school's purposes. A school system is not an adjunct of business and industry or the university; it is a partner in accomplishing *educational* objectives.

The practices that help build collaboration may take a great deal of time to develop. Traditional organizational forms may need to be changed and trust and confidence will be needed to make changes not only in the collaborative venture but the home setting which is a partner in developing the new venture. Change cannot happen without involvement and a sense of ownership in the process. Leadership that is adept at moving about with confidence in each of the participating settings is essential.

In a recent symposium on changing roles and responsibilities of school/ university partnerships, Liebermann and Negben (1990) quote Sarason who worked for years with the schools from his base at Yale University. He captures the complexities involved in moving effectively from one setting to the other.

> Those who are at home in the world of ideas and theory usually have never experienced the creating of a setting. They're interested in what is, has been, and should be. But they themselves have rarely, if ever, put themselves

> in a situation where the center of action has moved to the creation of what should be, where they will experience the problems as participants rather than as observers, and where theory and practice take on new relationships, the artist and the art critic, the person of action and the person of theory, the participant and the observer. People of action know that it's a fantastically complicated affair; people of ideas and theory know neither the game nor the score. People of ideas and theory know that most settings go seriously astray, that people of action are devoid of the "right ideas," and that the major task is how to wed practice to theory. There is some truth to both pictures, but neither group can understand this, perhaps because the people of action know they will have to think differently and the people of theory know they will have to act differently.

Mix a person or persons from business or industry with their particular styles and expectations with individuals imbued with the unique culture of the school or the again-different cultural characteristics held by university people and new dimensions are added that must be considered and dealt with by the collaborative venture.

Lyman, former President of Stanford and now chairman of the Rockefeller Foundation, suggests the premise on which new partnerships between schools and universities should be developed.

> Our work with the schools will not be effective unless, to use a phrase beloved by the Quakers, it *speaks to the condition* of the schools. To the actual condition, that is, and not to some idealized form that may exist in the minds of sheltered university faculty members, but is unattainable in the real world. ...One reason why the dividing line between schools and universities in this country so often seems more like a Grand Canyon than a grade crossing is because secondary school teachers and scholars have so little sense of being involved in a common enterprise....The major universities feel the impact of effective or ineffective performance on the part of the schools quite directly. On the other hand, universities bear some responsibility for the state of affairs in the schools, whatever that state may be. If we want the schools to recover some of their lost luster, and more importantly, to do a better job, we had better pitch in and try to help. ...If our health and our access to fossil fuels are worth the intensity of research effort that we seem to be

> declaring they are, surely the way we introduce children to the disciplined use of their minds is likewise worthy of attention (Stein, 1980).

The clarification and sanctioning of roles and responsibilities to accomplish identified purposes is essential. These roles and responsibilities must be valued and rewarded by the individual's home setting if the new venture is to be successful. Often when individuals are away from their home setting, the rest of their colleagues do not see their role as being that important to the unit. In these cases the leadership must protect participants in the collaborative venture and insure that their work is rewarded if it is of high quality. The role a person performs should be the basis for the performance evaluation. One way to protect participants is for leaders to engage all of the people in the home unit in discussions of the new venture and its purposes as related to their unit. If colleagues can't participate in the new partnership by being directly involved as innovators, they can be involved and participate by not being blockers. Everyone who is going to have input into a participant's performance evaluation must be involved in the communication cycle regarding purposes and roles right from the beginning of the effort.

A new book by Sirotnik and Goodlad (1990) provides further amplification of concepts, issues, and concerns relating to school/university partnerships. Also, Gross' (1988) book on partners in education is useful in providing specific examples of model programs which involve arts and science colleges as well as professional education programs.

A Special Role for FIPSE/FIRST

The letter of invitation to the conference on college-school partnerships indicated that one of the outcomes intended for this combined FIPSE/FIRST event was to produce policy recommendations for collaborative efforts to foster improved student learning. The other intended outcome dealt with funding priorities.

It will take some big ideas to match the enormity of the problems facing education. The *let the many flowers bloom* approach to funding currently utilized by FIPSE/FIRST and other federal and state agencies will not bring about the kind of massive, sustained, long-term change that is needed to improve education. Only a well-designed structure for comprehensive change will bring about the reforms needed. Such a structure already exists. It is the land-grant university system

which has already demonstrated its effectiveness in effecting change in the fields of agriculture and engineering. We would like to make the recommendation that FIPSE/FIRST put it to work in the educational reform movement.

The Morrill Act of 1862 subsidized a new type of institution in each state by grants of federal lands. This act institutionalized Thomas Jefferson's concept of the university as defined in the charter of the University of Virginia a half a century before. Jefferson envisioned his state's university as "an institution in which every branch of knowledge useful at this day is taught in its highest degree." Justin Morrill, in crafting the legislation that was to bear his name, spoke of enriching liberal education with practical education. The new law which required each land-grant college to offer programs in agricultural science, the machine arts (engineering), and military science ushered in fields such as forestry, home economics, business administration, education, journalism, and architecture.

Land-grant institutions spawned new organizational inventions that soon proved to be extraordinarily valuable: experimental farms and orchards, state experiment "stations", and the unique collaboration between counties and the federal government which we now know as cooperative extension. The land-grant campus placed new emphasis on applied, as well as basic, research by insisting that the best minds on campus join the search for answers to common problems. Problems in agriculture, such as the need for improved strains of corn, were brought to the university; the latest research findings about hybrid seed and planting practices were disseminated back to the farms and implemented. Successful farmers became the advocates and co-teachers who extended the new "best practice" to other farmers. What was built was a winning combination, a productive loop that brought real-life problems of the farms to the researchers and delivered the fruits of their research (applied as well as basic) back to the farms.

In a recent monograph calling for the revitalization of the land-grant mission, Enarson (1989) describes the uniqueness of the land-grant approach to research and development described above to solve the "people's problems." He points out that the tripartite mission of teaching, research, and extension (outreach) made the land-grant university system unique. Old forms of organization had to be adapted to accommodate the new reality of a university that combined, in a single institution teaching and research and extension, the explicit obligation to deliver new knowledge where it could be used.

In agriculture the tripartite mission was expressed by separate organizations and separate funding for the College of Agriculture, the Agriculture Experiment Station and the Agriculture Extension Service. The complex nature of the land-grant mission served to strengthen these institutions. In more than a century of service, the land-grant institutions have become, with few exceptions, America's premier institutions.

A number of highly respected leaders support the idea of directing the land-grant mission and structure to the problems of education. A few months ago at a dinner following a meeting with a committee of the Texas legislature, Assistant Secretary for Post-Secondary Education Leonard Haynes III reminisced about his days at Ohio State University and spoke eloquently about the uniqueness of the land-grant idea that pervaded that institution. He suggested that the time is right for the land-grant universities to use the already-existing structure of the land-grant delivery system to foster and implement research and development in the field of education the way they have in the fields of agriculture and engineering. He specifically addressed Texas A&M University and its prominent role in solving agricultural problems and stated it should now use these same principles and structure to address and solve the crisis in education. Acknowledging that education is the most important problem facing the United States today, Haynes suggested the top priority mission of the land-grant colleges for the next decade and early 21st century should be to solve this dilemma.

It should be noted that several other contemporary movements are compatible with various components in the land-grant system strategy for change although different labels are attached to them. For example, the Professional Development School concept described in the second Holmes Group report *Tomorrow's Schools: Principles for the Design of Professional Development Schools* (1990) is the equivalent of the "experiment station" in the agriculture model. The state of Michigan's Professional Development School Plan which is being led by Michigan State University, the University of Michigan, and Wayne State University, has earmarked $48 million from the private sector, the state legislature, and universities to support the professional development school movement throughout Michigan. The American Association of Colleges of Education / Ford Foundation Clinical School Project (1990) also has many of the characteristics of the Professional Development School movement. FIPSE/FIRST

should take the lead in convening a group of people involved in designing and implementing these "structures for change." The land-grant institutions are ready. The "time is ripe."

A comprehensive recommendation like this is only being made here because the FIPSE/FIRST collaborative effort is in a strategic position to construct and put forward such a far-reaching policy and plan for educational change. Even though the dialogue regarding the land-grant strategy could start with research and development in all of the subject fields dealt with at this conference, the most receptive places to start are probably in the fields of science and mathematics. NSF (National Science Foundation, 1990) is already moving toward statewide systemic initiatives as a strategy for comprehensive long-term educational change. FIPSE/FIRST could link its mission with the new NSF Statewide Systemic Initiative. The Black land-grant universities created by the Second Land-Grant Act of 1890 should also be linked as partners in the collaborative strategy.

This call for a comprehensive, national/state, collaborative thrust undergirded by a proven change-structure and accompanied by state and national policies to guide it, comes out of our experience in building partnerships at the state level through the Commitment to Education effort and as the institution designated by the Governor to develop Texas' NSF Statewide Systemic Initiative proposal. What has been missing in previous attempts at educational reform is a strategy for sustaining new ideas and building on them over the long haul. The land-grant research, teaching, and extension loop and the financial structure which supports it, is a change model to emulate in education.

The final reports at this conference reinforce the conclusion that in addition to supporting strategies for discovering new knowledge to improve teaching and learning, FIPSE/FIRST must focus on knowledge of how to use that knowledge in real settings. Together we need to develop a comprehensive, collaborative reform strategy that shortens the distance between thought and action in education.

Being an advocate for an idea like this within the Beltway and linking with others of mutual interest outside of Washington is a formidable challenge. Are the leaders of FIPSE/FIRST ready for this challenge? After participating in this conference, we think they are.

CONCLUSION

LEADERSHIP AND PARTNERSHIPS

Never has there been such an urgent clarion call for schools, universities, business and industry, and other community agencies to work together. Collaboration is not just an option today--it is a necessity and an obligation of leadership.

At long last this country seems to be taking seriously the need to improve education. A growing number of influential Americans now realize that the aspirations of our society can rise no higher than the quality of our educational system. Therefore, a "window of opportunity" to the future exists. The history of education indicates that such windows rarely stay open long in this society. There is a fleeting chance that we can make a difference. Let's try!

CONTEXT

- **Economic Changes**
  - Growth of Tertiary & Quaternary Sectors
  - Increasing Global Interconnectedness & Interdependence
- **Demographic Changes**
  - Cultural Pluralism
  - Shrinking Work-Age Cohort/ Growing Aged & Dependent Population
- **Societal Changes**
  - Changing Nature of the Family
  - Children in Poverty

CONCERNS

Crisis in Math, Science & Technology
Economic Viability

At-Risk Students/Dropouts
Illiteracy
Teacher/Faculty Shortages

CHALLENGE

Respond To These Conditions With A Bottom-Up Strategy By Developing Leaders To:

- Prepare Students in the 4 R's: Reasoning as well as Reading, 'Riting & 'Rithmetic
- Meet the Intellectual and Social Needs of the At-Risk
- Emphasize Global Awareness
- Increase Math, Science & Technology Competency
- Recruit, Educate, and Retain Teachers / Faculty in Critical Areas
- Restructure the Schools as Centers of Inquiry for Teachers and Students
- Develop New Systems of Collaboration Involving Schools, the University & Business

Commitment to Education Task Force
Dean C. Corrigan, President's Deputy for Educational Leadership
409•845•1561

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